JESSICA L. BURNETT

Research Ecologist & Mendenhall Postdoctoral Fellow
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Education

Ph.D. Natural Resource Sciences (Applied Ecology), University of Nebraska-Lincoln 2019
M.Sc. Wildlife Ecology & Conservation, University of Florida 2015
B.Sc. Wildlife Ecology & Conservation University of Florida 2013
A.A. General studies Valencia Community College 2010

Research Experience

Research Ecologist (GS-12), U.S. Geological Survey, Lakewood, Colorado, USA
September 2019 - present

- Developed knowledge graph for improving the provenance of U.S. bird conservation and management.
- Developed framework for evaluating the users and uses of a USGS data program. Used informatics and social science methods to identify opportunities for improving value of agency's data assets to stakeholders and partnering agencies. Published study findings and recommendations to program administrators in an agency report.
- Co-led grant application(funded) to Canadian Institute for Ecology and Evolution to fund a year-long working group. Developed software and database for analyzing environmental data for abrupt change and regime shifts.
- Co-led grant application (funded) for Earth Science Information Partnership working group. Developed knowledge graph for data and information management for developing U.S. State Wildlife Action Plans.
- Authored 2 peer-reviewed research articles, 1 federal agency report, and 3 R packages.

Graduate Research Assistant, Nebraska Cooperative Fish & Wildlife Research Unit, University of Nebraska-Lincoln, Nebraska August 2015 - August 2019

- Developed and evaluated statistical methods for detecting abrupt change in ecological and paleoecological communities.
- Worked closely with Designed research projects to meet needs of land managers on U.S. military bases.
- Published 8 peer-reviewed research articles, 1 book chapter, 3 reports, and 5 R packages.
- Developed and taught scientific programming to state wildlife agency practitioners and university students.

- Co-founder of the university's Chapter of the Association for Women in Science (AWIS). Worked closely with university administration to initiate institutional membership in AWIS. Organized mentoring workshop.

Young Scholar, Applied Systems Analysis Research Group, International Institute for Applied Systems Analysis (IIASA), Austria May 2018 - September 2018

- Developed novel method for detecting regime shifts in paleoecological data (system velocity).
- Conducted research with an international team of applied mathematicians and systems scientists. Presented research in an international forum.
- Organized seminar on Network Analysis in Ecology.

Graduate Teaching Assistant August 2013 - August 2015
Department of Wildlife Ecology & Conservation
University of Florida, Florida, USA

- Taught population ecology, invasion ecology, and scientific programming to university students.
- Published 2 peer-reviewed scientific articles.
- Led grant application to develop nature trail and receive nature-based educational materials for a local, non-profit organized aimed to reduce recidivism among community youth. Organzied afterschool activities of hands-on wildlife interactions with youth.

Geospatial Analyst Intern April 2012 - August 2012
Florida Fish and Wildlife Research Institute

- Designed and completed geospatial analysis of raptor and owl nest locations and nesting success.
- Performed ground-truthing of habitat data.

Undergraduate Research Assistant, Avian Ecology and Conservation Lab, University of Florida January 2011 - April 2012

- Developed and published field method for improved detection of Red-shouldered Hawk (*Buteo lineatus*).
- Managed laboratory's bird banding database.

Crew Leader and Smithsonian Fellow, Neighborhood Nestwatch Program, Gainesville, Florida May - July 2012 & April - August 2013

- Trained and led team of 3 bird banding technicians.
- Led community outreach programs for youth in state-sponsored afterschool and summer programs.
- Recruited and trained participatory scientists.
- Created and distributed outreach materials for program participants.

Publications

1. **J.L. Burnett**, R Dale, C.Y. Hou, G. Palomo-Muñoz, K.S. Whitney, S. Aulenbach, R.S. Bristol, D. Valle, and T. Wellman (*minor revisions*). Ten Simple Rules for Creating a Scientific Web Application. *PLoS Computational Biology*
2. Erickson, R.A., **J.L. Burnett**, M.T. Wiltermuth, E.A. Bulliner, and L. Hsu (2021). Paths to computational fluency for natural resource educators, researchers, and managers. *Natural Resource Modeling* DOI: 10.1111/nrm.12318
3. **Burnett, J.L.**, L.S. Wszola, and G. Palomo-Muñoz. 2019. bbsAssistant: An R package for downloading and handling data and information from the North American Breeding Bird Survey. Journal of Open Source Software, 4(44), 1768, DOI: 10.21105/joss.01768
4. Donovan, V.M., **J.L. Burnett**, C.H. Bielski, H.E. Birge, R. Bevans, D. Twidwell, and C.R. Allen. 2018. Social-ecological landscape patterns predict woody encroachment from native tree plantings in a temperate grassland *Ecology and Evolution* 8(19): 9624-9632 DOI:10.1002/ece3.4340
5. **Burnett, J.L.**, K.L. Pope, A. Wong, C.R. Allen, D.M. Haak, B.J. Stephen, and D.R. Uden. 2018. Thermal tolerance limits of the invasive Chinese mysterysnail *Bellamya chinensis* and implications for management. *American Malacological Bulletin* 36(1): 140-144 DOI:10.4003/006.036.0106
6. Roberts, C.P., D. Twidwell, **J.L. Burnett**, V.M. Donovan, C. Wonkka, C.H. Bielski, A.S. Garmestani, D.G. Angeler, T. Eason, B.W. Allred, M.O. Jones, D.E. Naugle, S. Sundstrom, C.R. Allen . 2018. Early warnings for state transitions. *Rangeland Ecology and Management* DOI:10.1016/j.rama.2018.04.012
7. La Sorte, F.A., C.A. Lepczyk, **J.L. Burnett**, A. Hurlbert, M. Tingley, and B. Zuckerberg. 2018. Opportunities and challenges for big data ornithology. *The Condor* 120(2): 414-426 DOI:0.1650/CONDOR-17-206.1

8. Chuang, W.C., A.S. Garmestani, T. Eason, T.L. Spanbauer, H.B. Fried-Peterson, C. Roberts, S. Sundstrom, **J.L. Burnett**, D. G. Angeler, B. Chaffin, L. Gunderson, D. Twidwell, C.R. Allen. 2018. Enhancing quantitative approaches for assessing ecological and community resilience. *Journal of Environmental Management* 213: 353-362 DOI:10.1016/j.jenvman.2018.01.083
9. **Burnett, J.L.**, C.R. Allen, C.P. Roberts, M.Bomberger Brown, and M.P. Moulton. 2017. Eurasian Tree Sparrow (*Passer montanus*) range expansion in North America. *Biological Invasions* 19(1): 5-9 DOI:10.1007/s10530-016-1273-4
10. **Burnett, J.L.** and K.E. Sieving. 2016. Songbird distress call as a detection enhancement method and application to Red-shouldered Hawks (*Buteo lineatus*). *Florida Field Naturalist* 44(4):157-168
11. C.R. Allen, H.E. Birge, S.L. Bartlet-Hunt, R.A. Bevans, **J.L. Burnett**, B.A. Cosens, X. Cai, A.S. Garmestani, I. Linkov, E.A. Scott, M.D. Solomon, and D.R. Uden. 2016. Avoiding decline: Fostering resilience and sustainability in midsize cities. *Sustainability* 8(9):844-868 DOI:10.3390/su8090844
12. **Burnett, J.L.** and M.P. Moulton. 2015. Recent trends in House Sparrow (*Passer domesticus*) distribution and abundance in Gainesville, Alachua County, Florida. *Florida Field Naturalist* 43(4):167-172

Book Chapters

1. **Burnett, J.L.** and C.R. Allen. 2020. Continental analysis of invasive Birds: North America *in* Downs, C.T. and Hart, L.A. (eds) Invasive Birds: Global Trends and Impacts. CABI International, Wallingford, UK, pp. 278-294.

Manuscripts Under Review (primary author)

1. **Burnett, J.L.**, R. Wilcox, B. Stephen, D. Haak, D. Uden, C.R. Allen, and K. Pope. Shell strength does not limit predation of an invasive snail species (Bellamya chinensis) by native fish. *under review at Malacological Bulletin*

Notable Code and Software

Lifecycle: maturing, stable

1. **Burnett, J.L.**, L.S. Wszola, and G. Palomo-Munoz. 2019. `bbsAssistant`: An R package for downloading and handling data and information from the North American Breeding Bird Survey: U.S. Geological Survey software release. DOI: 10.5066/P93W0EAW.
2. Price, N.B., C. Chizinski, and **J.L. Burnett**. `radsets`. An R package for interactive, network-based visualizations of overlapping sets. Github:natbprice/radsets
3. **Burnett, J.L.**, N.B. Price, and A.J. Tyre. `distanceTravelled`. An R package for calculating the distance traveled by a multispecies community along a time series.
4. Price, N.B. and **J.L. Burnett**. `tvdiff`. An R package for numerical differentiation of noisy, non-smooth data. Github:natbprice/tvdiff

Lifecycle: dormant

1. **Burnett, J.L.**, N.B. Price. `regimeDetectionMeasures`. An R package for calculating univariate and multivariate regime detection methods using community time series.

Lifecycle: experimental

1. **Burnett, J.L.**, K.R. Burgio, A. Fournier `USAvian`: An interactive map for connecting and visualizing the bird conservation and management networks in the U.S.

2. **Burnett, J.L.**, X. Benito, and K. Braziunas. `abruptdata`. An R package and information repository for ecological datasets exhibiting abrupt change.

Research Grants

Funded

1. Wee, B., **J.L. Burnett**, S. Aulenbach, W. Teng, R.A. Modeling data and information needs for avian conservation using Neo4j. Earth Science Information Partners Lab $3388
2. Pedersen, E., **J.L. Burnett**, G. Simpson, C. Bahlai. **2020**. Creating a unified approach to evaluate regime shift detection methods. Canadian Institution for Ecology and Evolution (CIEE) **$12,400 CAD**
3. **J.L. Burnett**. **2019-21**. Mendenhall Postdoctoral Research, Core Science Systems Science Analytics and Synthesis, U.S. Geological Survey. **~$222,000**
4. International Institute for Applied Systems Analysis (IIASA) Young Scholar Summer Program. **2018**. Funding sources: National Academy of Sciences and University of Nebraska-Lincoln. **~$12,500**

Not Funded

1. Pedersen, E., **J.L. Burnett**, G. Simpson, C. Bahlai. Creating a unified approach to evaluate regime shift detection methods. Powell Center Synthesis Working Group, U.S. Geological Survey 2020
2. Informing the design and deployment of a conservation tool, USAvian: learning through co-production, synthesizing lessons learned. Community for Data Integration, U.S. Geological Survey 2020
3. Benito, X., C. Bahlai, **J.L., Burnett**, E. Pedersen, and G. Simpson. SESYNC working group proposal. 2019
4. **Burnett, J.L.**. Population Biology Program of Excellence (PoE) Postdoctoral Fellowship, University of Nebraska-Lincoln 2018
5. **Burnett, J.L.**, C.R. Allen, G. Sugihara, and H. Ye. Scale mismatches in ecological research and management: consequences and solutions through data management. Powell Center Synthesis Working Group, U.S. Geological Survey 2018
6. **Burnett, J.L.** Mozilla Fellowship for Science 2016
7. **Burnett, J.L.** NSF Graduate Research Fellowship 2013

Fellowships, Honors & Awards

- Performance award FY21

2020

- Invited workshop participant, Future of Synthesis in Ecology, NCEAS

2019

- School of Natural Resources, University of Nebraska-Lincoln **$750**
- University of Nebraska Graduate Travel Fund **$750**
- Association for Women in Mathematical Biology **$650**
- School of Natural Resources, University of Nebraska-Lincoln **$1050**

2018

- Meritorious Graduate Student award, School of Natural Resources, UNL **$500**
- National Academy of Sciences research award **$5,500**
- Invited Participant, Workshop for Women in Mathematical Biology, NIMBIOS **$900**
- National Science Foundation & NimBios **$550**
- Nelson Memorial Fellowship, University of Nebraska-Lincoln *(3x recipient)* **totaling $3,217**
- Center for Great Plains Studies travel award, University of Nebraska-Lincoln *(4x recipient)* **totaling $3,000**

2017

- Kellogg Biological Station, Michigan State University **$500**
- Big Ten Academic Alliance Traveling Scholar

2016

- 2nd place, School of Natural Resources Elevator Speech Competition **$300**
- American Ornithologists' Union travel award **$250**
- Fling Fellow, University of Nebraska-Lincoln **$20,000**
- Othmer Fellow, University of Nebraska-Lincoln **$24,000**
- AAAS/Science Program for Excellence in Science Award
- Graduate Fellow, Center for Great Plains Studies, University of Nebraska

2015

- Resilience Alliance Young Scholar, The Resilience Alliance (2015-2017) 2015 - 17
- NSF Diversity Travel Award, Southeastern Ecology and Evolution Conference **$650**
- Graduate Student Council, University of Florida **$350**
- Office of Research, University of Florida **$350**

2014

- Travel Award, Department of Wildlife Ecology & Conservation, University of Florida *(2x recipient)* **$500**

2013

- Travel Award, Office of the Dean, Institute of Food and Agricultural Sciences, University of Florida **$750**
- American Ornithologists' Union Undergraduate Student Membership Award
- IFAS Extension Internship for Undergraduate Research, University of Florida **$2,200**
- Ordway-Swisher Biological Station Undergraduate Research Grant, University of Florida **$550**

Organized Sessions & Symposia

1. Using the integrated modelling framework to bridge science and decision making: advances, applications, and opportunities. Co-organizer with J.A. Royle. Ecological Society of America conference 2020
2. Bridging the gap between science and decision-making through the rapid prototyping of decision support tools. Co-organizer with D. Valle and L.S. Wszola. Ecological Society of America conference 2020
3. Opportunities and Challenges in Big Data Ornithology. Co-organizer with F.A. LaSorte and C.A. Lepczyk. North American Ornithological Conference V, Washington, D.C. 2016

Presentations (primary author)

Invited

1. Integrating data and information to enhance the digital efficeincy of wildlife conservation and management. North American Ornithological Conference 2020
2. Regime Detection Measures for the Pratical Ecologist, Department of Wildlife Ecology & Conservation, University of Florida 2019
3. Detecting abrupt change in bird community time series using distance travelled. *Association for Women in Math Biology Symposium*, Special session "Current Challenges in Mathematical Biology", Houston, TX 2019
4. Decline of the Once-Ubiquitous House Sparrow in North America. *Nebraska Invasive Species Council*, Lincoln, NE 2015

Contributed

1. **Burnett, J.L.**, N.B. Price, and A.J. Tyre. A novel method for tracking ecosystem trajectory and abrupt change in space-time: distance traveled. *International Association for Landscape Ecology*, Oral presentation. Fort Collins, CO, 2019
2. **Burnett, J.L.**, R. Crystal-Ornelas, D. Fogarty, K. Hogan, C.R. Allen, M. Bomberger Brown, D. Twidwell, and C.A. Lepczyk. Impacts of non-native birds on native wildlife in urban ecosystems: where is the evidence? *Natural Areas Conference*, Oral presentation. Indiana, 2018
3. **Burnett, J.L.**. Advances in ecological regime shift detection, *International Institute for Applied Systems Analysis*, Oral presentation. Laxenburg, Austria, 2018
4. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler,and D. Twidwell. Community velocity as a regime shift detection method. *Great Plains Grassland Summit*, Poster presentation. Denver, Colorado, 2018
5. **Burnett, J.L.**, L. Wszola, N. Mirochnitchenko, E. Stuber, M. Bomberger Brown, C.R. Allen, D. Twidwell, and J.P. Carroll. Gray partridge distribution in North America: Changing landscapes and environment for an introduced species. Perdix XIV and IUGB, Oral presentation by JPC, Montpellier, France, 2017
6. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler,and D. Twidwell. System trajectory and Fisher information as early-warning indicators of ecological regime shifts. *Resilience 2017: Resilience Frontiers for Global Sustainability*, Poster presentation. Stockholm, Sweden, 2017
7. **Burnett, J.L.**, N.B. Price, A.J. Tyre, T.J. Hefley, C.R. Allen, T. A. Eason, D.G. Angeler,and D. Twidwell. System trajectory and Fisher information as early-warning indicators of ecological regime shifts. *Ecological Society of America*, Poster presentation. Portland, OR, 2017
8. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D., and Tyre, A.J. Ecological Regime Shifts in the Central Great Plains. *Great Plains Symposium*, Oral presentation. Nebraska Innovation Campus, Lincoln, NE, 2017
9. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D., and Tyre, A.J. Using Big Data to Detect Regime Shifts in Space and Time. *North American Ornithological Conference VI*, Poster presentation. Smithsonian Migratory Bird Institute, Washington, D.C., 2016
10. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M., and Robinson, S.K. Are House Sparrow declines a byproduct of urban greening? Southeastern Ecology and Evolution Conference, Oral presentation. University of Georgia, Athens, GA, 2015

11. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M.L., and Robinson, S.K. Are House Sparrow declines a byproduct of urban greening? *American Ornithologists' Union and Cooper Ornithological Society Annual Meeting*, Poster presentation. Norman, OK, 2015
12. **Burnett, J.L.**, Moulton, M.P., and Sieving, K.E. House sparrow: the decline of a once ubiquitous, invasive species. *Florida Chapter of The Wildlife Society Annual Conference*, Poster presentation. Safety Harbor, FL, 2014.
13. **Burnett, J.L.**, Moulton, M. P., Sieving, K.E., Avery, M.L., and Robinson, S.K. House Sparrow decline and distribution in North Central Florida. *Florida Cooperative Fish and Wildlife Research Unit annual cooperators meeting*, Poster presentation. Gainesville, FL, 2014
14. **Burnett, J.L.** and Sieving, K.E. Detecting birds of prey using tufted titmouse distress calls. *USGS Florida Cooperative Fish and Wildlife Research Unit Committee Meeting*, Poster presentation. Gainesville, FL, 2013
15. **Burnett, J.L.** and Sieving, K.E. Do actual and perceived risks of small forest birds align? *Florida Ornithological Society Conference, Oral presentation*, St. Petersburg, FL, 2013
16. **Burnett, J.L.** and Sieving, K.E. Perceived predation risks of small forest birds. *Association of Field Ornithologists Annual Conference*, Poster presentation. Venus, FL, 2013

Scientific Outreach

Community Involvement

- Letters to a Pre-scientist, United States 2019-present
- Skype a Scientist, United States 2017-present
- Co-PI, Community grant to develop on-site nature trail and viewing opportunities at the Reichert House, Gainesville, FL 2014-15
- Hands-on captive herpetological opportunities for studnets of the Reichert House, Gainesville, FL 2014-15
- Birdwatching and live banding demonstrations for K-12 students, A Girls' Place, Gainesville, FL 2013-15
- Science, mathematics and reading tutor for middle and high school students, Friends of the Micanopy Library, FL 2011-13
- Learning assistant and tutor for geometry and pre-calculus students, Valencia Community College, Oralndo, FL 2008-10

Blogs

- Connecting to nature and understanding ecosystem services: urban perspective, Envirobites
- Big data, big problems, Resilience Alliance
- Panarchy in the Anthropocene, Resilience Alliance - Regime shifts, traps and how to deal with them, Resilience Alliance
- Connecting to nature and understanding ecosystem services: the urban perspective, Resilience Alliance
- Leadership resilience and your workplace, Resilience Alliance

Radio

- House Sparrow declines in North American, Urban Wildlife Podcast

Service

Department of Interior

- Member, Federal Advisory Committee for Avian Knowledge Network (AKN)
- Member, Communications and Marketing Committee for the North American Breeding Bird Survey 2020 Action Plan

Peer Review Activity

- Department of Interior: Abstracts (2), Research Articles (1), Software/code (1), Reports (2)
- Code and software: *Journal of Open Source Software* (3), *ReScience* (1)
- Scientific manuscripts: *Bioinvasions Records* (1), *Conservation Biology* (1), *Ecological Informatics* (5), *Ecological Modelling* (4), *Journal of Molluscan Studies* (2), *Landscape and Urban Planning* (1), *PLOS One* (1), *Wilson Journal of Ornithology* (3)

Other Selected Service

- Co-founder, Natural Resources Diversity Initiative committee, School of Natural Resources 2017
- Co-founder, Institutional membership to the Association for Women in Science 2016
- Faculty Advisory Committee, School of Natural Resources 2016-18

Reports

1. **Burnett, J.L.**, Roberts, C.P., Allen, C.R., Angeler, D.G., Twidwell, D. 2017. White Paper: Regime Shift Detection Using Fisher Information. Strategic Environmental Research and Development Program (SERDP RC 25-10), Department of Defense.

2. Allen, C.R., Angeler, D.G., Twidwell, D., **Burnett, J.L.**, Roberts, C.P. 2017. Interim Report (RC 25-10): Global Change, Vulnerability, and Resilience: Management Options for an Uncertain Future. Strategic Environmental Research and Development Program (SERDP), Department of Defense.

3. Twidwell D., Bielski, C.H., **Burnett, J.L.**, Donovan, V.M., Wonkka, C.L. 2017. Review of LANDFIRE Biophysical Settings Models (BpS) in the Great Plains. LANDFIRE Project.

Notable Trainings and Certifications

- Leadership and Management Skills for Non-managers, Management Concepts 2021
- Basic Wildland Firefighting (SF-1390, SF-190) 2014
- Basic FirstAid (annual recertification) 2020